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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/088,877 | 08/05/2002 | Zhongyun Fan | 78104.041 | 4969 |

7590 09/05/2003

DeWitt Ross & Stevens
Intellectual Property Department
Firststar Financial Centre
8000 Excelsior Drive Suite 401
Madison, WI 53717-1914

EXAMINER

TRAN, LEN

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

1725

DATE MAILED: 09/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n No.

10/088,877

Applicant(s)

FAN ET AL.

Examiner

Len Tran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 August 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3,8.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-13 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kono (US 5,836,372), and further in view of Rice et al (US 6,308,768) in view of GB 2 276 831.

Kono discloses a method and apparatus for shaping a liquid metal alloy comprising the steps of cooling the alloy temperature below the liquidus temperature while applying shear at a sufficiently high shear rate to convert to a thixotropic state. The alloy is transferred into a shot

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assembly which injects the alloy to the mold. A control valve (60) is placed between the extruder and the shot assembly (figures and col. 3, lines 10-65). The screws are driven by an electric motor.

Kono fails to teach the extruder having at least two screws which are at least partially intermeshed.

However, Rice et al disclose a primary rotor and a secondary rotor (14 and 16) for the purpose of mixing the semi-solid metal.

Rice et al lacks the teaching that two rotors have blades that are intermesh with each other.

However, GB '831 discloses a twin screw extruder having intermesh blades to provide good mixing.

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide the concept of Rice et al with the construction of the blade of GB '831, in Kono in order to provide good mixing to the thixotropic metal.

4. Claims 14-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kono (US 5,836,372), and further in view of Rice et al (US 6,308,768) in view of GB 2 276 831 as applied to claim 7 above in 3rd paragraph, and further in view of Hansma (US 5,322,111).

Kono, Rice et al, and GB '831 disclose the claimed invention above, but lacks the teaching of shrink fitting an inner and outer barrel of the extruder.

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However, Hansma discloses a ceramic lined shot sleeve having a steel outer portion with a ceramic inner portion by shrink fitting since the ceramic liner 60 is less prone to thermal shock, corrosion and physical wear than is a common metal shot sleeve, and is also less costly to replace in the event that replacement.

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide shrink fitting the steel sleeve and ceramic as taught by Hansma, in Kono, Rice et al, and GB '831 in order to reduce thermal shock, corrosion, and physical wear.

In addition, for the above reason, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to make the screw of sialon ceramic for its durability.

Inquiry

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Len Tran whose telephone number is (703)605-1175. The examiner can normally be reached on M-F, 8:30 - 5.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on 703-308-3318. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0661.

Len Tran
Examiner
Art Unit 1725

LT
September 1, 2003



M. ALEXANDRA ELVE
PRIMARY EXAMINER